



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,608	09/29/2003	Tetsuo Ono	520.38979CX1	8510

20457 7590 04/04/2006

ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 NORTH SEVENTEENTH STREET
SUITE 1800
ARLINGTON, VA 22209-3873

EXAMINER

VINH, LAN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 04/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/671,608

Applicant(s)

ONO ET AL.

Examiner

Lan Vinh

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10, 12 and 21-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10, 12, 21, 22, 24 and 25 is/are allowed.
- 6) ☒ Claim(s) 23, 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/646,012.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment/Argument

1. The applicants argument that the teachings of the applied references would have neither disclosed nor would have suggested wherein a mixing rate of the adhesive gas to be mixed with the halogen gas ranges from 0.5%-50% is moot in view of the newly cited reference of Gutsche et al (US 6,177,353). Thus, the indication of allowable subject matter in claim 20 has been withdrawn in view of newly found reference of Gutsche et al (US 6,177,353)

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites the limitation "said processing steps". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 1765

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ye et al (US 6,080,529) in view of Gutsche et al (US 6,177,353)

Ye discloses a method of etching wherein a substrate where a mask layer without containing carbon as a major component formed on the layer to be processed is laid on a support pedestal/sample board in a vacuum container (col 11, lines 30-35; fig. 5), plasma is generated inside said vacuum container (col 10, lines 64-66), radio frequency bias voltage is applied on said pedestal/sample board (col 10, lines 55-56) and plasma treatment is provided by periodic on-off control radio frequency bias voltage applied on said pedestal/sample board (col 16, lines 60-65); wherein the plasma consists of a mixture of chlorine and BCl₃/halogen gas and CH₄/methane/carbon hydride/adhesive gas (col 17, lines 27-34)

Unlike the instant claimed invention as per claim 26, Ye fails to disclose that a mixing rate of the adhesive gas to the halogen gases ranges from 0.5-50%

Gutsche discloses a method of plasma etching comprises the step of etching using a mixture of chlorine and BCl₃/halogen gas and CH₄/methane/carbon hydride/adhesive, wherein the mixing rate of CH₄/adhesive gas to the halogen gases ranges from 0-20% (col 7, lines 1-7)

Hence, one skilled in the art at the time the invention was made would have found it

obvious to modify Ye etching gas mixture by using a mixing rate of the adhesive gas to the halogen gases in the ranges as taught per Gutsche because Gutsche discloses that the percentage of CH₄ addition to the total flow of Cl₂ and BCl₃ is preferably between about 2-8% (col 7, lines 6-8)

Allowable Subject Matter

5. Claims 10, 12, 21-22, 24-25 allowed.

Claim 23 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is an examiner's statement of reasons for allowance:

Regarding claims 21-22, the cited prior art of record fails to disclose or suggest a surface processing method of a sample comprises a step of etching said n-type polycrystalline silicon and said p-N type polycrystalline silicon by introducing mixed gas containing fluorine and oxygen into said vacuum container while applying periodically on-off controlled radio frequency bias voltage, in combination with the rest of the limitations of claims 21-22

Regarding claims 24-25, the applicants have presented a persuasive argument, see page 10 of the response filed on 2/10/2006 that the cited prior art of record fails to disclose or suggest a surface processing method of a sample comprises a limitation of wherein a percentage of on-period accounts for 5 to 60% in a cycle of on-off control of said radio frequency voltage, and said sample is treated by said plasma, in combination with the rest of the limitations of claims 24-25

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lan Vinh whose telephone number is 571 272 1471.

The examiner can normally be reached on M-F 8:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571 272 1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>.



LV
April 03, 2006